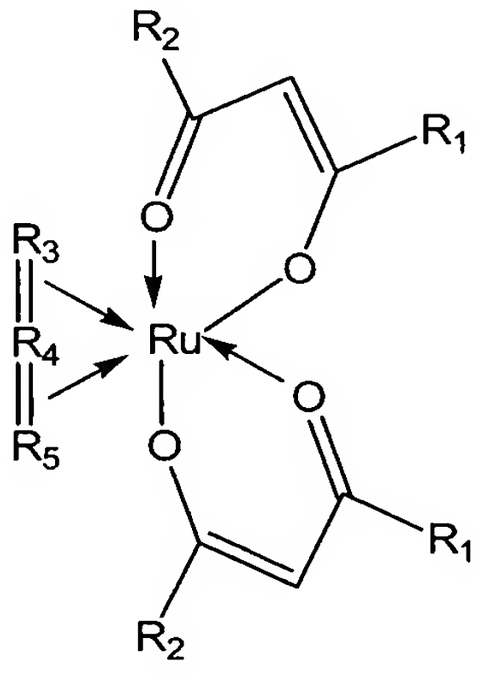
In the Claims:

1. (Original) A method for forming a ruthenium film, the method comprising supplying a two β-diketones-coordinated ruthenium complex as a ruthenium source and oxygen onto a substrate and depositing the ruthenium film using chemical vapor deposition (CVD).

2. (Original) The method according to claim 1, wherein the ruthenium source is a two β -diketones and one diene-coordinated ruthenium complex as represented by the formula 1:



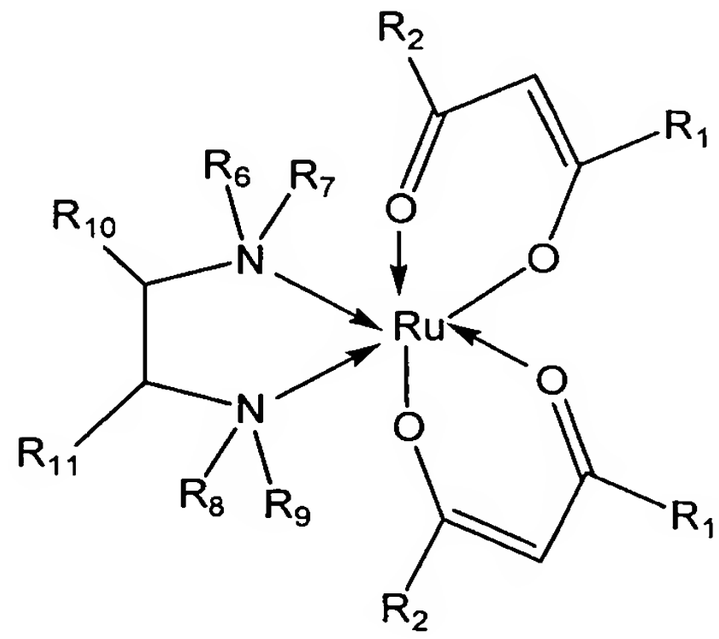
(1)

wherein R_1 and R_2 are alkyl groups; the total carbon number of R_1 and R_2 is 3 to 5; and R_3, R_4 and R_5 are interconnected to each other to form a chain.

3. (Original) The method according to claim 2, wherein the diene is 1,4-cyclohexadiene, norbornadiene, or 1,5-cyclooctadiene.

4. (Original) The method according to claim 2, wherein R_1 and R_2 are asymmetric.

5. (Original) The method according to claim 1, wherein the ruthenium source is a two β -diketones and one diamine-coordinated ruthenium complex as represented by the formula 2:



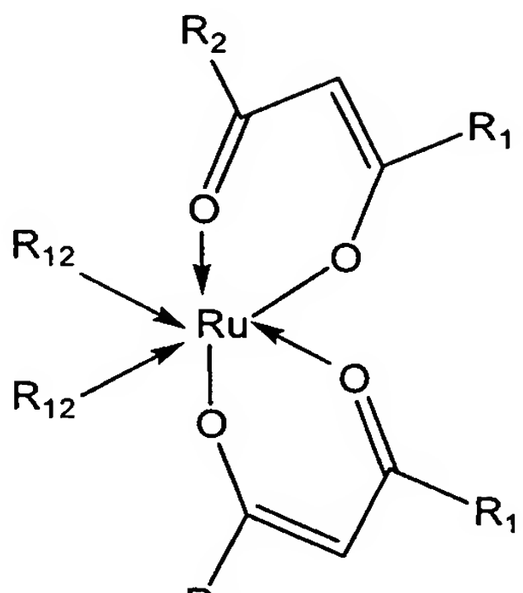
(2)

wherein R_1 and R_2 are alkyl groups; the total carbon number of R_1 and R_2 is 2 to 5; R_6, R_7, R_8, R_9, R_{10} and R_{11} are independently hydrogen or alkyl groups; and the total carbon number of R_6, R_7, R_8, R_9, R_{10} and R_{11} is 2 to 8.

6. (Original) The method according to claim 5, wherein the diamine is N,N,N',N'-tetramethylethylenediamine.

7. (Original) The method according to claim 5, wherein R_1 and R_2 are asymmetric.

8. (Original) The method according to claim 1, wherein the ruthenium source is a two β -diketones and two organic ligands-coordinated ruthenium complex as represented by the formula 3:



(3)

wherein R_1 and R_2 are alkyl groups; the total carbon number of R_1 and R_2 is 2 to 5; and two R_{12} groups are olefin, amine, nitrile or carbonyl.

9. (Original) The method according to claim 8, wherein the olefin is ethylene, propylene, 2-methylpropylene, butyl, or 1,3-butadiene.

10. (Original) The method according to claim 9, wherein the amine is trimethylamine or triethylamine.

11. (Original) The method according to claim 10, wherein the nitirile is acetonitrile or acrylonitrile.

12. (Original) The method according to claim 8, wherein the two β -diketones are 2,4-hexanedione, 5-methyl-2,4-hexanedione, 2,4-heptanedione, 5-methyl-2,4-heptanedione, 6-methyl-2,4-heptanedione, or 2,4-octanedione.

13. (Original) The method according to claim 1, wherein the ruthenium source is bis(isoheptane-2,4-dionato)norbornadiene ruthenium ($Ru(C_7H_8)(C_7H_{11}O_2)_2$).

14. (Original) The method according to claim 1, wherein the oxygen is supplied at a flow rate of 20-60 sccm.

15. (Original) The method according to claim 14, wherein the ruthenium source is supplied at a flow rate of 0.2-1 ccm.

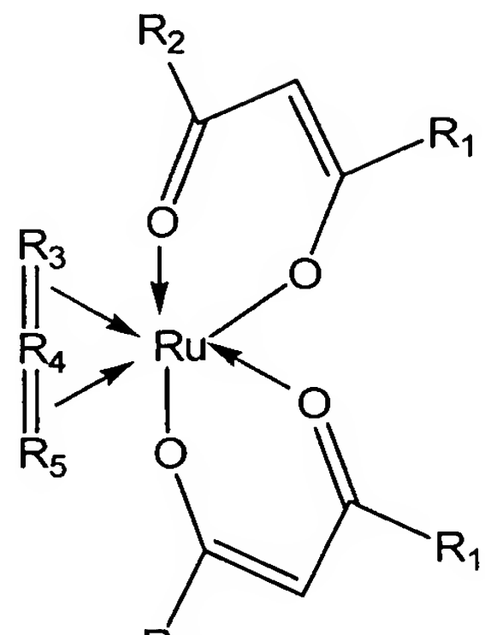
16. (Original) The method according to claim 1, wherein the ruthenium film is deposited at a temperature of 330-430°C.

17. (Original) The method according to claim 1, wherein the ruthenium film is deposited at a pressure of 0.5-5 Torr.

18. (Original) The method according to claim 1, wherein the depositing of the ruthenium film includes supplying an inert gas, including nitrogen and argon, onto the substrate.

19. (Original) A method for forming a ruthenium film, the method comprising supplying a two β -diketones-coordinated ruthenium complex as a ruthenium source at a flow rate of 0.2-1 ccm and oxygen at a flow rate of 20-60 sccm, and depositing the ruthenium film using CVD.

20. (Original) The method according to claim 19, wherein the ruthenium source is a two β -diketones and one diene-coordinated ruthenium complex as represented by the formula 1:



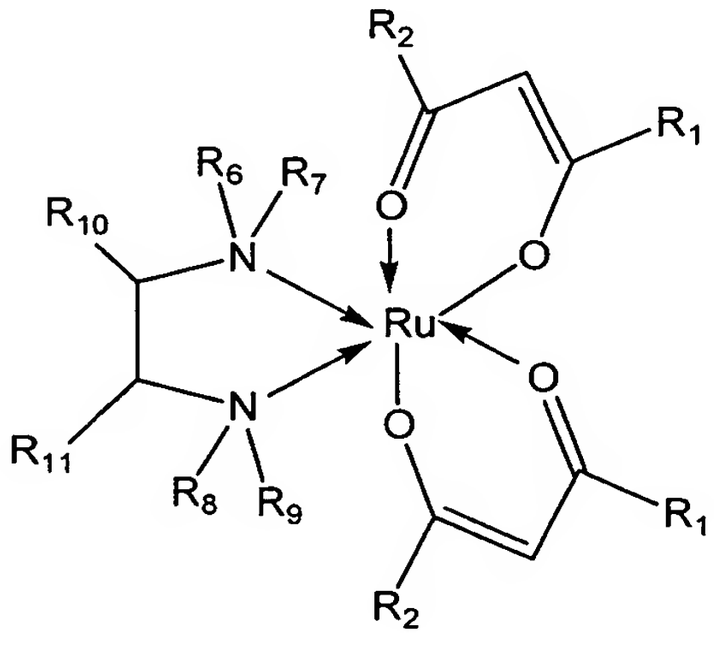
(1)

wherein R_1 and R_2 are alkyl groups; the total carbon number of R_1 and R_2 is 3 to 5; and R_3, R_4 and R_5 are interconnected to each other to form a chain.

21. (Original) The method according to claim 20, wherein the diene is 1,4-cyclohexadiene, norbornadiene, or 1,5-cyclooctadiene.

22. (Original) The method according to claim 20, wherein R_1 and R_2 are asymmetric.

23. (Original) The method according to claim 19, wherein the ruthenium source is a two β -diketones and one diamine-coordinated ruthenium complex as represented by the formula 2:



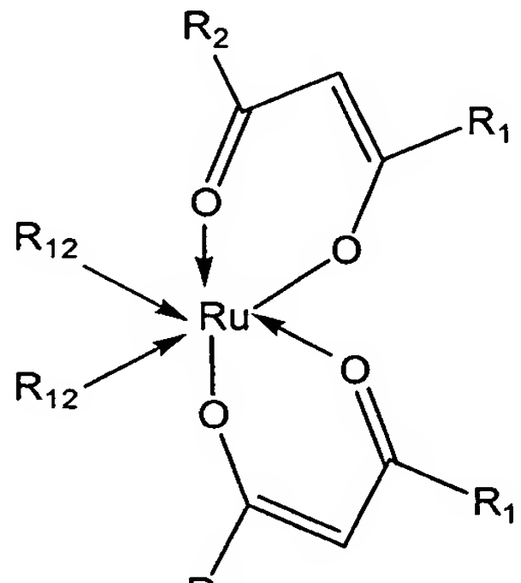
(2)

wherein, R_1 and R_2 are alkyl groups; the total carbon number of R_1 and R_2 is 2 to 5; R_6, R_7, R_8, R_9, R_{10} and R_{11} are independently hydrogen or alkyl groups; and the total carbon number of R_6, R_7, R_8, R_9, R_{10} and R_{11} is 2 to 8.

24. (Original) The method according to claim 23, wherein the diamine is N,N,N',N'-tetramethylethylenediamine.

25. (Original) The method according to claim 23, wherein R_1 and R_2 are asymmetric.

26. (Original) The method according to claim 19, wherein the ruthenium source is a two β -diketones and two organic ligands-coordinated ruthenium complex as represented by the formula 3:



(3)

wherein R_1 and R_2 are alkyl groups; the total carbon number of R_1 and R_2 is 2 to 5; and two R_{12} groups are olefin, amine, nitrile or carbonyl.

27. (Original) The method according to claim 26, wherein the olefin is ethylene, propylene, 2-methylpropylene, butyl, or 1,3-butadiene.

28. (Original) The method according to claim 27, wherein the amine is trimethylamine or triethylamine.

29. (Original) The method according to claim 28, wherein the nitirile is acetonitrile or acrylonitrile.

30. (Original) The method according to claim 26, wherein the two β -diketones are 2,4-hexanedione, 5-methyl-2,4-hexanedione, 2,4-heptanedione, 5-methyl-2,4-heptanedione, 6-methyl-2,4-heptanedione, or 2,4-octanedione.

31. (Original) The method according to claim 19, wherein the ruthenium source is bis(isoheptane-2,4-dionato)norbornadiene ruthenium.

32. (Original) The method according to claim 19, wherein the ruthenium film is deposited at a temperature of 330-430°C.

33. (Original) The method according to claim 19, wherein the ruthenium film is deposited under a pressure of 0.5-5 Torr.

34. (Original) The method according to claim 19, wherein the depositing of the ruthenium film includes supplying an inert gas, including nitrogen and argon, onto the substrate.

35. (Original) A method for forming a ruthenium film, the method comprising supplying bis(isoheptane-2,4-dionato)norbornadiene ruthenium at a flow rate of 0.2-1 ccm and oxygen at a flow rate of 20-60 sccm and depositing the ruthenium film at a temperature of 330-430°C under a pressure of 0.5-5 Torr using CVD.

36. (Original) The method according to claim 35, wherein the depositing of the ruthenium film includes supplying an inert gas, including nitrogen and argon, onto the substrate.

37. – 52. (Cancelled.)